few are blurred, but the majority are sufficiently full of detail to be of great aid to the reader. Two might well have been spared without injuring the value of the volume in the least—the map of Mammoth Cave (Plate 22, Fig. 2) on which the lettering is so small as to be read with difficulty, and the plate supposed to show the forms of crystals.

Criticism might well be urged against the table of geological "epochs and formations," since the terms 'primary' and 'secondary' are used in conjunction with Paleozoic and Mesozoic, as though they were in as frequent use as the latter, and the term 'tertiary' is used as synonymous with Cainozoic. 'Azoic' is also used as the time term corresponding to the formation term Archean, in spite of the fact that the presence of fossils in the Archean rocks (Huronian and Laurentian) is not positively denied. Finally the term Algonkian has no place in the table. While, of course, it is permitted to the author to decline to accept this term as having a definite significance, it is at the same time unfortunate for his readers that they are not made familiar with it, if only as an aid toward the understanding of the handsome geological maps of the U. S. Geological Survey.

There are 19 chapters in the book. The first three treat of rocks, their formation and decay, the fourth of mountains, the next two of glaciers, the seventh of underground waters, the eighth of the relation between sea and land, the ninth of the interior of the earth, the tenth and eleventh of volcanoes, the twelfth of coral islands, the next three of fossils—their organization and their teachings, the sixteenth of land surfaces, and the last three of metals, minerals, building stones, etc.

No one need hesitate for an instant in recommending this little volume for use in our high schools and academies. It is by far the best thing of its kind that has yet appeared upon the market.—W. S. B.

A Handbook of Rocks, for use without the Microscope by Dr. J. F. Kemp[2] is a very welcome visitor to the desk of the teacher of geology. There has long been needed a little treatise on lithology which might be used as an introduction to the study of rocks and as a text-book for the use of those students in geology who have no intention of taking up the subject as a specialty. The volume before us fills this need completely. It is an excellent little book, as full of detail as is desirable for a book of its character and as accurate as is possible in one of its size. Each of the main families of rocks is well characterized

[2] J. F. Kemp: A Handbook of Rocks, for use without the Microscope with a glossary of names of Rocks and other Lithological Terms. Printed for the author. New York, 1896, pp. vii, 176. Price in lots of ten copies $1.00 each.

in a few discriminating sentences, analyses of many varieties are given and the structures and textures of all are well described. One of the most commendable features of the volume is the use of only the more important rock-names in the body of the text—the less important ones being relegated to a very comprehensive glossary which forms a convenient appendix to the book. In this respect, as in some others, the volume under review is very much more satisfactory to the untechnical reader than the other volumes of similar character that have recently come under our notice.

The work opens with a description of the rock-forming minerals and a discussion of the principles of rock classification. Following this are the descriptions of the rocks. These are divided into Igneous, Aqueous (including Eolian) and Metamorphic rocks. Each class is divided into groups according to chemical composition, and each group is further subdivided according to texture. The classification is an eminently practical one, and at the same time it can give no offense to the micoscopical lithologist.

In the discussion of the rock-types each chapter begins with a list of analyses; this is followed by comments upon them. Then comes a description of varieties, a statement of relationships, a paragraph on geological occurrence, one on alterations and one on distribution. In that portion of the book that deals with the igneous rocks the glasses are first taken up, then the porphyritic varieties and, finally, the granitic ones. The aqueous rocks are grouped as mechanical sediments, limestones, organic remains and precipitates from solution. Of the metamorphic rocks two great classes are recognized, viz., those produced by contact action and those produced by regional metamorphism.

The above outline of the contents of the volume is very brief, but it is sufficiently full to indicate that the author has covered well the field that such a treatise as this one should cover. This book should find a wide sale among engineers as well as among all teachers who introduce into their courses on geology a description of rocks. It is a far more valuable synopsis of the characteristics of rock types to place in the hands of geological students than the synopses contained in the large text books on geology.—W. S. B.